

REMARKS

Claims 1 to 35 are currently pending in the subject application, and are presently under consideration. Claims 12 to 24 are allowed. Claims 1 to 3, 8 to 10, 25 and 29 to 31 are rejected. Claims 4 to 7, 11, 26 to 28 and 32 to 35 have been indicated as allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Favorable reconsideration of the application is requested in view of the amendments and comments herein.

I. Amendment to the Specification

The Related Applications section of the present application has been amended to replace the identified attorney docket numbers with the application serial numbers.

II. Rejection of Claims 1, 2-3, 8-10, 12, 16, 25, and 29-31 under 35 U.S.C. 103(a)

Claims 1, 2 to 3, 8 to 10, 12, 16, 25, and 29 to 31 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Publication No. 6,654,858 to Asher, et al. ("Asher") in view of U.S. Patent Publication No. 6,615,319 to Khare, et al. ("Khare"). Applicant traverses this rejection for the following reasons.

In regard to claim 1, the Office Action admits Asher does not disclose a conflict response indicating that an ordering point for the data is migrating according to a second cache coherency protocol. However, the Office Action contends that Asher discloses a second node provides a conflict response to the second request for the data. We respectfully disagree with this contention. In constructing the rejection of claim 1, the Office Action improperly pieces together unrelated features of the systems disclosed in Figures 3 and 4 of Asher in a manner that is not consistent with what is actually disclosed in Asher. It is well settled that, the Examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed. See, e.g., *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998). In contrast to claim 1, the system of Fig. 3 disclosed in Asher provides a second request for the data from node 522 (READFWD), but the second node in this system does not provide a conflict response to the second request for the data. Instead, in response to

the second request for the data in Fig. 3, the owner node 522 sends the data to the requesting node 518 via a BLKSHARED message and informs the home node 520 that the data is now shared at nodes 522 and 518 via a VICTIMACKSHARE message. See Asher Fig. 3 and col. 6, line 37 to col. 7, line 43. Thus, Asher fails to teach or suggest conflicts and conflict messages in the transaction shown in Fig. 3 as purported in the Office Action.

Additionally, Asher fails to teach or suggest a second request for the data, consistent with what is recited in claim 1, in the embodiment of Fig. 4 in Asher. That is, because the home node 532 of the approach in Fig. 4 of Asher already has a copy of the data (Asher, at Fig. 4 and col. 7, lines 44 to 67), there would be no purpose to provide a second request for the data as recited in claim 1. In contrast, Asher discloses the requesting node may modify the cache block upon receiving a BLKEXCLCNT message. Asher, at col. 7, lines 63 to 67. Asher also remains silent regarding whether the data is either transferred from node 532 or if the data is already shared at the requesting node 530. Asher, at col. 7, lines 63 to 67. Furthermore, in the system of Fig. 4 of Asher, the requesting node (i.e., the first node, not the second node) stalls incoming requests and potential write backs of the data blocks (i.e., the first node provides the conflict responses).

Moreover, Asher fails to disclose a second node provides a conflict response in response to a second request for the data in the system of Fig. 4. *Id.* Instead, in Fig. 4 of Asher, the INVALIDACK responses from the shared nodes 534, 536, and 538 are provided in response to a SHAREDINV invalidation request from the home node, but are not sent in response to a second request for the data. Asher Fig. 4 and col. 7 lines 44 to 67. Thus, Asher, in the system of Fig. 4, fails to disclose that the second node provides a conflict response in response to a second request for the data, as recited in claim 1. Asher also fails to teach or suggest that an ordering point for the data migrates. Instead, Asher discloses that "during system initialization, each node in the system is programmed with which nodes are the home nodes for each block of data in memory." Asher col. 7, lines 1 to 3. Therefore one of ordinary skill in the art would not be motivated to combine these unrelated parts of the cited systems of Asher to create what is recited in claim 1.

The Office Action contends that Khare cures the admitted deficiencies of Asher by disclosing a conflict response indicating that an ordering point for the data is migrating according to a second cache coherency protocol. We also respectfully disagree with this contention. For example, Khare also fails to teach or suggest ordering point migration, or a conflict response

indicating that an ordering point for the data is migrating. Instead, Khare teaches a system with a conflict detection method that is distributed between a system node controller ("SNC") and a snoop filter of a scalability port (SP) switch. See Khare col. 6, lines 14-27. However, Khare fails to disclose that an ordering point migrates such that there would be a purpose for employing a conflict response to indicate that an ordering point is migrating consistent with claim 1. Specifically, at the end of the cited transactions in Khare, the conflict detection mechanism remains distributed between the same SP switch 230 and the same SNC 210 of a processor as existed before the transaction began. See Khare Fig. 6A, 6B and col. 7, lines 6 to 53. Even in the case of a system with multiple SP switches, Khare discloses that the included multiple snoop filters of the SP switches keep track of mutually exclusive sets of cache lines and a cache line is tracked at all times by only one snoop filter. Khare col. 4, lines 11 to 24. Khare also remains silent regarding changing the snoop filter which tracks a particular cache line. Therefore, the system of Khare fails to teach or suggest ordering point migration.

Additionally, the system of Khare fails to disclose that a second node provides a second request for the data via a second cache coherency protocol which is different from the first cache coherency protocol. Instead, Khare teaches that the system nodes are coupled via a point-to-point scalability port (SP) switch, e.g. an inter-node interface used to enable the implementation of a shared memory architecture, multi-processor system. See Khare col. 2, lines 24 to 37. Khare also remains silent regarding whether the nodes provide requests and responses via different protocols and fails to provide any detail on how the disclosed protocols operate together. Finally, the home node in Khare receives requests from the scalability port and not from the first node. See Khare Figs. 6A and 6B. Therefore, Khare fails to cure the admitted deficiencies of Asher in disclosing claim 1.

For the reasons discussed above, one of ordinary skill in the art at the time of the invention would not be motivated to combine the system of Asher with the system of Khare to create the system of claim 1. Accordingly, Applicant respectfully requests reconsideration and allowance of claim 1 and dependent claim 10.

In contrast to claim 2, Khare discloses that the SP switch provides a retry request in response to the read request from node A, but fails to disclose a request or a conflict message from the home node. See Khare Fig. 6B, and col. 7, lines 6 to 34. Moreover, in the cited

sections of Khare, the home node does not send any retry requests but only data and write complete acknowledgments. Therefore, Khare fails to cure the admitted deficiencies of Asher in disclosing claim 2. Since there is no teaching or suggestion in the combined teachings of Asher and Khare to create a system with the added features of claim 2, Applicant respectfully requests reconsideration and allowance of claim 2.

The Office Action contends that Asher in view of Khare discloses claim 3. We respectfully disagree with this contention. For example, in Fig. 6A of Khare the retry request is sent from the SP switch responsive to the write request from the second node B. Khare Fig. 6A. In Fig. 6B of Khare, the retry request is associated with the first read request, (not a second read request), and the retry request is also sent from the SP switch but not the home node. Again, as stated in support of claim 2, no requests are sent from home node C in the cited systems disclosed in Khare. Therefore the system of Khare fails to cure the deficiencies of Asher in disclosing claim 3. Accordingly, Applicant respectfully requests reconsideration and allowance of claim 3.

Additionally, Applicant notes the text of Khare ambiguously describes figures 6A and 6B is inconsistent with what is actually depicted in these figures. For example, Fig. 6B appears to illustrate that at time t9 a snoop request is received at node C, but Khare describes Fig. 6B by stating that a snoop result is received at the SP switch and node A. Compare Khare, at Fig. 6B and col. 7, lines 50 to 53. One of ordinary skill in the art could only speculate as to the intended meaning of Khare due to the significant ambiguities contained in the prior art reference. Therefore, one of ordinary skill of the art would not be motivated to create the systems of claims 1, 2 or 3 based upon the ambiguous teachings of Khare. Accordingly, Applicant respectfully requests reconsideration and allowance of claims 1, 2 and 3 additionally based upon this reasoning.

Claim 25 is allowable over Asher in view of Khare at least for the reasons given in support of claim 1. Additionally, neither Asher nor Khare teach or suggest a transition state associated with migration of an ordering point for the data from the first processor node, as recited in claim 25. Accordingly, Applicant respectfully requests withdraw of the rejection of claim 25 and the objections to dependent claims 26 to 29.

The Office Action contends that Asher discloses the additional features of claims 9, 16 and 30. We respectfully disagree with this contention. Instead, Asher fails to teach or suggest a null-directory cache coherency protocol as disclosed in claims 9, 16 and 30. Accordingly, Applicant respectfully requests reconsideration and allowance of claims 9, 16, and 30.

For reasons similar to those given in support of claims 1, 2 and 3, Asher in view of Khare fails to teach or suggest claim 31. Specifically, the Office Action admits Asher fails to teach a response indicating ordering point migration from the cache of a first processor to the cache of a second processor. Moreover, Khare discloses a system wherein transactions are ordered by the combination of a SP switch and SNC of a node, but not by a cache of a processor. See Khare col. 6, lines 14 to 27. Additionally, Khare fails to disclose receiving a response at the home node associated with migration of an ordering point. Instead, Khare discloses that the home node receives only speculative read, port read and port write transactions. Therefore, Khare fails to cure the admitted deficiencies of Asher. Accordingly, Applicant respectfully requests reconsideration and allowance of claim 31.

III. Allowable Subject Matter

Claims 4 to 7, 11, 26 to 28, and 32 to 35, would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, Claims 4 to 7, 11 to 26 and 32 to 35 are dependent from claims 1, 25 and 31 and should be patentable without being rewritten in independent form, because claims 1, 25 and 31 are patentable for the reasons stated above with respect to claims 1, 25 and 31.

Applicant appreciates the Examiner's allowance of claims 12 to 24.

IV. CONCLUSION

In view of the foregoing remarks, Applicant respectfully submits that the present application is in condition for allowance. Applicant respectfully requests reconsideration of this application and that the application be passed to issue.

Applicant notes the art documents made of record but not relied upon, but submits that the pending claims are patentable over the art of record. Should the Examiner have any questions concerning this paper, the Examiner is invited and encouraged to contact Applicant's undersigned attorney at (216) 621-2234, Ext. 106.

No additional fees should be due for this response. In the event any fees are due in connection with the filing of this document, the Commissioner is authorized to charge those fees to Deposit Account No. 08-2025.

I hereby certify that this correspondence is being transmitted to the U.S. Patent and Trademark Office via electronic filing on June 15, 2007.

Respectfully submitted,

/Gary J Pitzer/

Gary J. Pitzer
Registration No. 39,334
Attorney for Applicant(s)

CUSTOMER NO.: 022879

Hewlett-Packard Company
Legal Department MS 79
3404 E. Harmony Road
Ft. Collins, CO 80528